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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|------------------------|------------------|
| 09/992,474 | 11/14/2001 | Seung-Beom Park | 8071-5 (OPP 000681 US) | 7543 |
| 7590 | 04/22/2004 | | EXAMINER | |
| Frank Chau F. CHAU & ASSOCIATES, LLP Suite 501 1900 Hempstead Turnpike East Meadow, NY 11554 | | | KIELIN, ERIK J | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2813 | |
| DATE MAILED: 04/22/2004 | | | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/992,474 | PARK ET AL. |
| | Examiner | Art Unit |
| | Erik Kielin | 2813 |

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 22 January 2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 10-13 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-9 and 14 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action responds to the Amendment filed 22 January 2004.

Drawings

1. The proposed drawings corrections were received on 22 January 2004. These drawings are approved.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

Replacement Drawing Sheets

Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment. Any replacement drawing sheet must be identified in the top margin as "Replacement Sheet" and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin.

Annotated Drawing Sheets

A marked-up copy of any amended drawing figure, including annotations indicating the changes made, may be submitted or required by the examiner. The annotated drawing sheets must be clearly labeled as "Annotated Marked-up Drawings" and accompany the replacement sheets.

Timing of Corrections

Applicant is required to submit acceptable corrected drawings within the time period set in the Office action. See 37 CFR 1.85(a). Failure to take corrective action within the set period will result in ABANDONMENT of the application.

If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings MUST be filed within the THREE MONTH shortened statutory period set for reply in the "Notice of Allowability." Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136 for filing the corrected drawings after the mailing of a Notice of Allowability.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,298,199 (**Hirose et al.**).

Regarding claim 1, **Hirose** discloses a liquid crystal display comprising:

a first panel **71** having inner and outer surfaces;

a second panel **73** facing the first panel and having inner and outer surfaces;

a pixel electrode provided on the inner surfaces of the first panel (col. 3, lines 62-67);

a common electrode provided on the inner surfaces of the second panel (col. 3, lines 62-

67); and

a liquid crystal layer **72** (col. 3, lines 62-67) between the first and the second panels,

wherein a voltage value of a first gray (called " V_{OFF} ") representing the darkest state applied

between the pixel electrode and the common electrode is within a voltage range for yielding a

quotient greater than or equal to about 0.8 for all viewing angles when a contrast ratio at the voltage value is divided by a contrast ratio when the voltage applied between the pixel electrode and the common electrode is zero (col. 4, lines 30-49). Reasoning follows.

As stated by Applicant in the instant specification, “[t]he contrast ratio is defined as the luminance of the sixty-fourth gray divided by that of the first gray,” wherein the “first gray represents the darkest state.” With this definition in mind, Fig. 2 of **Hirose** shows that the transmission (i.e. luminance) at zero applied volts exists, while **at some applied voltage, the transmission is virtually zero**. Then, the contrast at **zero** applied volts is **finite** while that the first gray (i.e. the applied voltage) is **infinite** (i.e. 64th luminance divided by a number that is nearly equal to 0). Then the contrast ratio at the applied voltage divided by the contrast ratio at zero voltage is infinity divided by some finite number which equals infinity which is infinitely greater than 0.8.

Hirose discloses that the contrast improvement is for all viewing angles because the asymmetry of viewing angles is eliminated (col. 2, lines 47-59; col. 4, lines 46-49).

It is seen to be inherent that the pixel and common electrodes are on the inner surfaces of the first and second substrates **71, 73**; otherwise, the electric field generated would be insufficient to control the orientation of the liquid crystals **72**.

Regarding claim 2, **Hirose** discloses the liquid crystal display of claim 1, further comprising a first and second polarizers **50, 80** disposed on respective outer surfaces of the first and the second panels (Fig. 1; col. 3, lines 57-60).

Regarding claim 3, **Hirose** discloses the liquid crystal display of claim 2, wherein the liquid crystal layer is vertically aligned in absence of electric field (Figs. 1 and 2; sentence bridging cols. 3-4).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hirose** et al. in view of US 6,256,082 B1 (Suzuki et al., **Suzuki-2** hereafter).

Regarding claims 4, 5, and 7, the prior art of **Hirose**, as explained above, discloses each of the claimed features except for the electrodes further comprising domain-defining member for restricting the tilt directions of molecules in the liquid crystal layer, provided in one or both of the first and the second panels, wherein the domain-defining member is openings in the pixel electrode or the common electrode.

Suzuki-2 teaches that openings are provided in the pixel and/or common electrodes to restrict the tilt directions (col. 3, lines 17-23) which creates micro-regions (i.e. domains) and improves the contrast and view angle (col. 3, lines 13-16).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use domain-defining openings in the electrodes of **Hirose** to improve the contrast and view angle, as taught by **Suzuki-2**.

Regarding claim 6, the prior art of **Hirose**, as explained above, discloses each of the claimed features except for the voltage value of the first gray is equal to or lower than 1.4 V. The selection of 1.4 V or the first gray voltage is obvious because it is a matter of determining optimum process condition by routine experimentation with a limited number of species. See *In re Jones*, 162 USPQ 224 (CCPA 1955)(the selection of optimum ranges within prior art general conditions is obvious) and *In re Boesch*, 205 USPQ 215 (CCPA 1980)(discovery of optimum value of result effective variable in a known process is obvious). One of ordinary skill would be motivate to use a first gray voltage of less than 1.4 volts to minimize power consumption, thereby leading to a more energy-saving device.

Regarding claim 8, **Suzuki-2** teaches at least two micro-regions (i.e. domains), which reads on the limitation “wherein regions divided by the openings are classified into four domains depending on the tilt directions of the liquid crystal molecules.” (See Figs. 5a-5h).

6. Claims 9 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,573,695 B1 (**Liu et al.**) in view of US 4,832,454 (**Walters**).

Regarding claim 9, **Liu** discloses a liquid crystal display comprising:
a first and second panel **301, 401** each having inner and outer surfaces, with inner surfaces facing each other;
a common electrode **403** disposed on the inner surface of the first panel and a pixel electrode **306-308** disposed on the inner surface of the second panel; and
a liquid crystal layer having crystal molecules **314** disposed between the first and second panels, wherein a domain defining member **302, 303, 404, 406** is formed in one of the common

electrode 403 and the pixel electrode 306-308 for restricting the tilt directions of the crystal molecules.

(See Figs. 2-5, col. 4, line 19 to col. 5, line 57.)

Liu does not indicate that the voltage of the first gray is less than or equal to 1.4 V.

Walters teaches that it is standard practice in the art to use a voltage less than or equal to about 1.4 V for the first gray voltage (i.e. V_{off}), such as 0 V and 1.12 V, and 1.45 (col. 3, line 45 to col. 4, line 33).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use a first gray of 1.4 V or less as the first gray voltage in **Liu** in order to minimize power consumption and because it is standard practice in the art, as indicated in **Walters**.

Regarding claim 14, **Liu** discloses the domain-defining member includes a plurality of openings 302, 303, 404, 406 arranged laterally along a longitudinal direction, with at least one opening disposed in a direction transverse to the longitudinal direction (Fig. 2, col. 3, lines 3-13; col. 4, lines 52-57, col. 5, lines 52-57).

Response to Arguments

7. Applicant's arguments filed 22 January 2004 have been fully considered but they are not persuasive.

Applicant argues that Hirose does not teach the contrast ratio of greater than or equal to 0.8 for all viewing angles. In this regard, Applicant argues at p. 11 of the Amendment,

“Hirose relates to a biaxial optical anisotropy device and does not disclose a voltage range for the first gray voltage, for all viewing angles, that is determined based on a relationship between the contrast ratio

at an applied first gray voltage and the contrast ratio at 0 volts, as recited in amended claim 1.” (Emphasis added.)

Examiner respectfully disagrees for reasons indicated in the rejection over Hirose above which are included herein in their entirety. Additionally, it is noted that the highlighted feature is **not** claimed. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant continues at p. 11,

“Indeed, Hirose contains no suggestion regarding the voltage range of the first gray, and **is not concerned with viewing angle**. In FIG. 2, Hirose shows only a reformed voltage-transmission curve. In contrast, claim 1 recites a voltage range for the first gray based on contrast ratio at every viewing angle.” (Emphasis added.)

As stated above, Hirose is --in fact-- concerned with viewing angle. Accordingly, Applicant has not considered the entirety of the Hirose reference. (See Hirose at least at col. 2, lines 55-59 and col. 6, lines 46-52.)

Applicant argues that selection of 1.4 V for the first gray is not a matter of routine optimization. Examiner respectfully disagrees. The explanation relied upon is based upon the device with particular features which are not claimed. Applicant has not enabled all means for giving the ratio of contrast ratios as claimed for all possible devices. Rather the contrast ratio is specific to the features of the disclosed device which are, nonetheless, not claimed. Applicant cannot claim a result that is highly desired in the art when Applicant has not enabled but one manner in which to achieve the result, as this amounts to claiming the invention of another.

Applicant's arguments with respect to claims 9 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin
Primary Examiner
16 April 2004